THE SPACE GAMER

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THE SPACE GAMER

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THE SPACE GAMER's goal is growth and improvement of the hobby through service to the hobbyist gamer. Activities of all publishers, groups, and individuals involved in SF&F gaming are considered input to THE SPACE GAMER's casual format.

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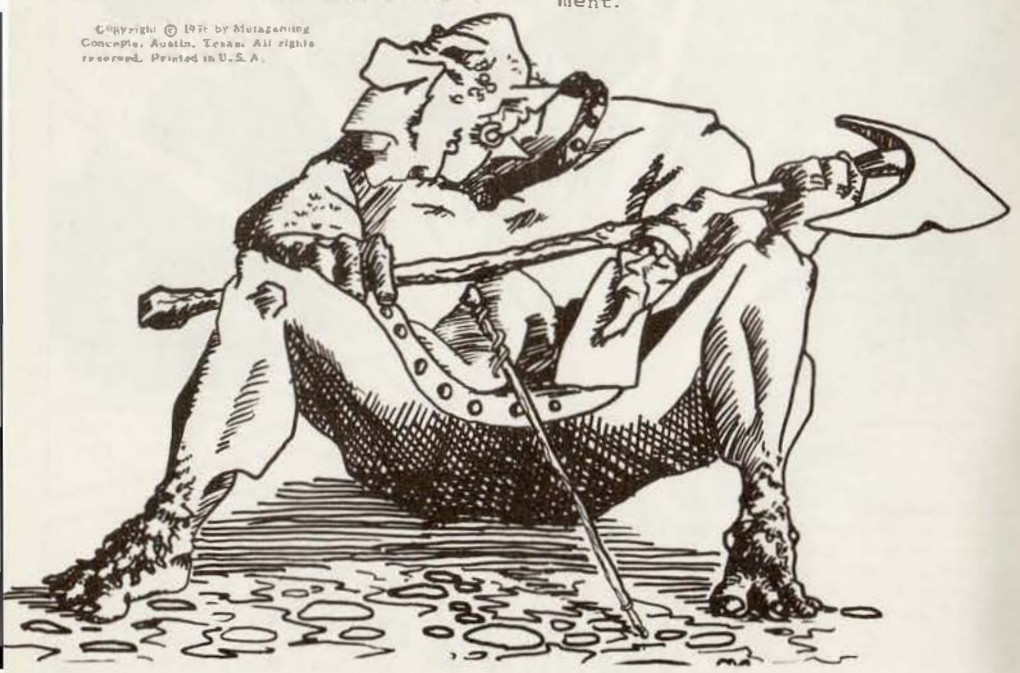


WHERE WE'RE GOING...

Issue number 5 of TSG marks the beginning of our second year of publication. In this brief time TSG has grown from what was expected to be a small hobby-level circulation to bigger than anticipated. Those of you who received TSG #1 have noted an expansion to 32 pages, more and better art, and a diversity of content We've been fortunate in building a base of writers and artists whose skills, frankly, are sufficient for a far more professional format.

Our trial policy of offering SF&F games by other publishers at a discount to our subscribers has proved immensely popular. The discount policy was intended to be a reader service to help you find the best games in one convenient source. We hoped response would be of adequate volume to support discounting and so it has, by a huge margin.

Being popular is nice, but it bas caused problems. Based on initial response to STELLAR CONQUEST, TSG and MGC were expected to operate at a very modest hobby level. No one would make a living but it would be fun and worth the work. What has happened as a result of TSG is that we've barely kept up with mail and orders during the last six months. All steff is part-time at small or no compensation. That's fine for a hobby volume, but not for the amount of mail we often get weekly. The idea was to spend most time on game design and innovations that bigger publishers don't try. What's happened in actuality is that 80% of the effort goes into getting your games out and often late at that. Because of the unexpectedness of the volume, operating cost has been near double what it could be with adequate planning. So, 'til now, we've missed much of the potential economic benefit of bigger volume.

In TSG #1 it was stated we wouldn't do anything that wasn't appealing to us in the way of game projects and design. With all we have to do, that still true in spades. We'd rather sell games you like by other publishers than design something similar we find dull. In order to free effort for game design, MGC and TSG are being reorganized functionally. You won't see a difference except in the gradual improvement of service. But for us it means a division of effort into business functions and creative functions. Most of the new staff-time goes into the business side. These people don't even play or particularly like games for the most part. Their function is inventory control, order processing, accounting, etc. The functional duties of the business effort are service and efficiency. Their rewards, monetary and psychic,are keeping customers happy with accurate, rapid order handling. The business function also has word-processing and production responsibility for TSG and games, as supervised by the creative function.

The planning, writing, and game-designing responsibilities are lumped under the creative function. One or two key individuals will have dual business and creative duties, but most staff won't. Someone playtesting a game won't be worrying about a stack of mail or hustling items through the printer. Someone editing a game or article will have the time to do the job thoroughly without numerous minor distractions. This functionalizing of effort should greatly facilitate completion of creative projects now stagnated. The typists and order-fillers won't see customer service and production work as time taken from enjoyment of games because they could care less about games. The games' creative staff will have time to do games with only task definition responsibility in other limited areas. Thie functional approach won't be perfect, nothing ever is, but it will get more productive time for all tasks. I'm sure I could dig back in my M.B.A. course material and find all this philosophy discussed somewhere. Philosophical discussion is no substitute for hands-on operations and an M.B.A. is useless in a small business. You just try harder and do better 'til you get it right.

Basic TSG/MGC policy is to develop a sustainable market for SF&F games. The best way of doing this is through services to the SF&F gamer. The discount policy is one such service. TSG is another such service. We hope to make TSG/MGC the innovative leader in SF&F games by continuing to concentrate on gamer needs as the focus of the hobby. It's a case of seeing our best interest as doing more and better for the SF&F gamer. Initial efforts are limited by money and time with time being the most recent bang-up. Money policy is very conservative--don't spend it unless we've got it and for heaven sakes, never borrow. This approach means TSG/MGC can grow only from earnings, but it means we will never face a debt-generated financial crisis. As we get our current operations smoothed out, more projects become possible. For one, we'd like to attend some SF and game conventions around the country to get to see more people. We won't,with some local exceptions, until we can bring activities and pizazz with us rather than just man a huckster table. If we can't bring some fun and novelty it doesn't seem worth the effort or consistent with our innovation goals.

Toward the latter pert of 1976 you'll begin to see some of our plenning efforte being implemented. We'll probably do a lot more advertising this fall to build our customer base even more. There will be some fund-raising activities with

specific projects in mind. Our merchandising will also begin to cover more than just games. We've wanted to offer SF&F art and space combat art for those who value the visual impact of the hobby. We would also like to publish some TSG-size special topic booklets to meet some reader interests that won't fit into TSG. Advanced rules for THE YITHRI, STELLAR CONQUEST, and an expanded, rewritten novelet of the Eldon Tannish series are among several topics being considered. Some of these may be offered to readers free as bonuses for re-subscription. If you've already extended a subscription, don't worry, you'll get any re-stucription bonus that we offer. If possible, a choice of bonuses will be offered to insure every re-subsctiber gets something he wants.

There will also be some surprises from TSG/MGC in the next twelve to twenty-four months. These will not be pre-announced or discussed in TSG to avoid competition getting miles out of one of our good ideas. After all, we've got a few thousand dollars at best to publicize new ideas. SPI or A-H could easily put hundreds of thousands of dollars or more into something new before we ever had a chance to get started. (For example, as TSG grows and SF&F gaming keeps booming, it becomes ever surer that SPI will put out a specialty SF&F gaming zine of their own. Whereas it may take TSG years to reach 5,000 subscribers, SPI could probably do it in six months or less.)

Finally, it seems appropriate now, at the baginning of our second year, to thank you for "where we've been" the past year. Iour support, interest, and enthusiasm has motivated us to give more innovative SF&F gaming in return. Stay with us for year two!

LASER WEAPONS
Present, (Hypothetical) Future

In writing S-F or designing S-F games finding an imaginative and at the same time believeable weapons system is often a problem. At present the only working example we have of the predicted death rays, beams, etc., of the future is the laser. However the number of classes and types of devices included under the broad title laser is so proflic, that it should continue to provide an almost infinitc source of ideas for the writer and game designer.

Laser stands for Light Amplification and Stimulization through Emission of Radiation. All atoms have the ability to absorb, momentarily store, and then release energy from the electron orbits in the form of radiation (light; visible, ultra violet, infra red; etc.). In the laser, atoms are excited by a flash, electric discharge, heat or some other means in order to cause the electrons in a large portion of the atoms to jump to different and higher encrgy orbitals. When a high enough population density of atoms at the excited state is reached a cascade effect can take place. A photon of energy (light) which is released by a single electron dropping to a lower energy orbit will strike the electron of a neighboring atom at a similar energy level causmg the second electron to release an identical photon or energy along a parallel course. These two photons of energy will strike two other excited electrons causing them to emit two additional photons along a parallel course in a cascading effect until untold billions of photons of energy are released at the end of the laser tube or media. All are identical in wavelength and parallel in direction.

The first laser in 1960 was a solid state synthetic ruby tube excited by a flash lamp. Since then many compounds have been used in solid state lasers. Many are merely a mixture of selected contaminates in a solid glass rod. A flash lamp is still the usual means of activation and some solid state lasers have achieved substantial power outputs. However, solid state lasers have a very large problem to overcome in high power output due to the difficulty of cooling a solid rod. No laser has yet been developed which does not give off most of its activation energy as waste heat, which must be removed or the laser will suffer molten consequences.

An offshoot of the solid state laser is the semi-conductor laser. In composition and appearance this is closely related to the transistor and emits radiation from the n-p junction point of the semi-conductor, after the direct application of electric current. There are liquid state lasers, but as of yet none in the high output energy range, and for that reason none that we are interested in.

Gas state lasers can be divided into several important groups. The original gas lasers were gas filled tubes activated by flash lamp or high voltage discharge inside the tube.

The gas chemical laser uses the energy released by the reaction of two chemicals in the gas state within the laser tube. This type of reaction usually must be triggered by flash lamp or electric discharge, but once started the explosive reaction of the gases supplies the power for the laser pulse.

The gas-dynamic lasers are currently the most powerful and promising of all laser types. Most gas-dynamic lasers are flasb lamp, electric discharge, or chemically activated gas lasers in which the gas is rapidly and continuously forced into the laser tube, activated and discharged, and then forced out. With the chemical laser the gas is spent and discharged as waste gas and beat, but with the other types the gas can be cooled and recirculated. The ability to rapidly transfer gas and therefore heat is what allows the gas-dynamic laser to operate at a sustained high output energy.

The thermally pumped gas-dynamic laser is a special case. A mixture of gases at about 1400° Centigrade is pushed through a supersonic expansion nozzle so that the gases increase in speed and drop in pressure very rapidly. The electrons of each atom of the gases are held in the excited state by the combination of heat and pressure, but the sudden loss of pressure in the expansion end of the nozzle allows all the electrons to suddenly drop to lower energy levels and thereby produce a discharge. Specially designed supersonic nozzles are often narrow slits with the laser beam forming and traveling parallel to and just down flow from the nozzle slit. This type is the most powerful continuous output laser yet reported at 60,000 Watts.

Almost any of the previously mentioned laser types can be made to operate in pulses varying from continuous operations to less than one t rilliontb of a second. Although the exact time varies with type and dimensions of each laser, a good idea of their pulse speed can be gained by considering that the period from activation of the flash lamp to the passing of peak output point of the typical CO_2 (carbon dioxide) pulse gas laser is less that two millionths of a second.

To get some idea of what we are discussing in terms of performance look at Tables I & II and remember that one Watt (W) equals one Joule (J) per second.

It can be seen from the tables that a 60,000 W thermally pumped gas-dynamic laser will vaporize one cubic centimeter of Iron in just over one second.

Lasers have been used in weapons systems for several years, but only in low power functions. Range finding on United Kingdom, Japanese, and West German main battle tanks is done by laser, and the U. S., USSR, Austria, and Sweden are either developing or actually installing laser range finding equipment on their main battle tanks. The USAF currently has two tactical ground support weapons using laser guidance; the LASER MAVERICK ground support missle. and the HOBO smart bomb.

At least one patent has been given on a laser rifle and a laser pistol. Tbe rifle uses a flash lamp activated pulse laser with optical fibert to concentrate the produced radiation into a narrow beam. The rifle is supposedly effective to a range of 100 to 200 yards. The band laser is a scaled down version of the laser rifle with about the same size and shape as some of the currently marketed battery powered hand drills. The patent also describes how both rifle and pistol may also be used for spot welding.

Even if the rifle and pistol will effectively function as described, something I am a little doubtful about, this type of moderate energy, narrow beam weapon has only limited military value. The laser rifle with current power limits can penetrate less armor than a convential armor piercing rifle bullet. If used on personnel the narrow beam pulse laser will not produce the shock on impact that a rifle bullet will and all wounds are automatically cauter-

ized by the heat of the laser.

As of yet no pure laser weapon has made it past the blueprint stage, but news reports and rumors are strong that the Soviet Union may be very close to an anti-ballistic missile laser weapon. When considering these reports, keep in mind that two Russians have won a Nobel Prize in Physics for their work in lasers and a disproportionate number of articles on gas-dynamic laser are written by men with names like Sokovikov and Konyakhov. If the Russians are close, it may be with a rocket pumped gas-dynamic laser.

Deciding on a laser type for a weapon involves more than just picking the most powerful. The wavelength of radiation emitted by a laser is primarily a funtion of what type of atom is being excited within the laser. Depending on the materials of the target, a given wavelength of laser radiation may be almost entirely absorbed, and therefore very effective, or almost entirely reflected away. If in the near future any nation tries to adopt a laser operating at one wavelength for all infantry or all tanks, other nations will immediately consider issueing clothing treated to be reflective to that wavelength of radiation and perbaps a new metalic reflective primer paint coating for their tanks. The first generation laser infantry or tank weapons will have to be powerful enough to burn through defensive reflective materials or a mixture of different wavelength types must be used on the battlefield in order to complicate the use of reflective coatings.

As a laser beam passes through the atmosphere, tbe gases in air will bend, scatter. and even absorb the energy of the beam. Optical techniques are being perfected to reduce the bend and scatter effect but they cannot be eliminated. A high energy continuous output laser beam strong enough to be an effective weapon will heat the air along the beam and cause the beam to scatter (referred to as thermal blooming). The energy delivered to the target by a continuous laser strong enough to produce thermal blooming is inversely proportional to the third power (cube) of the distance. The susceptibility of a laser to thermal blooming is to some extent a function of the operating wavelength of that laser, but all continuous output lasers will suffer a drastic fall off in effect with increasing range when thermal blooming occurs. Short pulse lasers do not suffer from thermal blooming, but to apply sufficient energy to the military target, the microsecond pulse must reach into the million watt (gega watt) range, which causes the air along the beam to actually ionize from the intensity of the beam. This will cause an even more drastic loss in energy with distance.

As a laser beam begins to blast a hole through a metal surface the metal itself will vaporize and flash out of the forming hole back toward the laser. This cloud of vaporizing metal (called a plasma jet) will cause the beam to extend up to 90% of its energy just to burn a hole in the cloud. For obvious reasons a fast pulse laser beam is affected far less by the plasma jet than is a continuous output laser.

News reports several months ago covered the U. S. public debate over whether the government should continue funding for the development of the laser trigger for thermonuclear bombs. The optically concentrated beam from a laser can easily generate the millions of degrees needed to trigger a fusion reaction, but it is a problem of getting the laser trigger down to the size necessary for a compact warhead. While the public reason for the laser trigger is to eliminate the long life radioactive contamination of the atmosphere associated with the plutonium fission trigger, there may be a stronger military reason. With fission there is a critical mass limit which prevents miniaturization of that triggering system, the laser trigger appears to be the only real hope for extremely small fusion warheads. With expected developments in lasers and micro-optics, it should be feasible to produce a thermonuclear warhead small enough to fit into a rifle bullet within a decade or two. A 160 grain 264 Magnum rifle bullet consisting of a 110 grain bullet jacket, a 30 grain chemical laser, a 22 grain micro-optic beam concentrator, and 2 grains of fusion material (Deuterium and Tritium) could hit a ten foot diameter target at three-quarters of a mile and cause an explosion equal to 14 tons of TNT. (1 lb. = 7000 grains)

The laser infantry weapon of the future is a question mark as to exactly when it will arrive and exactly what type of laser it will be. If the waste heat problem, and low efficiencies are

Table I

Type of Laser	Gas	Output	Efficiency
Continuous output chemical gas-dynamic	$H_2 + F_2 = 2HF$	4,500 W	10%
Continuous output thermally pumped gas-dynamic	$2CO + O_2 = 2CO_2$	60,000 W	1%
Pulsed electrical	CO_2	2,000 J/pulse	24%

dramatically improved, the laser will probable be a continuous output electrically powered weapon much like the STAR TREK band phasers with their energy packs. With no dramatic breakthroughs in cooling or efficiency the laser rifle may use short burst or pulse type mini chemical gas-dynamic lasers which are ejected red-hot after each pulse much as empty casings are ejected from a modern rifle.

One plausible method of reducing the effects on thermal blooming or air ionization on the laser beam, that could have a drastic effect on the appearance and operation of the laser rifle would be the use of the converging beam. As the laser beam leaves the tube within the weapon it enters a diverging lens the that will increase the diameter of the beam 10 fold and thereby reduce the power density of the beam 100 fold. After leaving the diverging lens the beam passes through a converging lens that will cause the beam to gradually converge as it leaves the weapon and travels to the target. The beam will have a high energy concentration only as it narrows down close to the target, and only then will thermal blooming or air ionization occur. The rate of beam narrowing can be mechanically changed on the rifle. This system would give you a laser pistol or rifle with good range which looks like a large spotlight with a pistol grip on the back.

The use of the laser as a sniper weapon offers interesting possibilities. The weapon could be easily silenced so that only a very low pop could be heard when the beam struck the target. Since many of the wavelengths lasers emit at are invisible to the eye, only the actual hit on the target could be seen even at night. Even using visible wavelength radiation, the fast pulse laser is too fast to be seen by the eye. However iooization of the air by fast pulse laser would probable linger long enough to be seen. Using a converging beam pulse laser at night would cause mini-flashes along the beam next to the target. A miss would probably look like a long very weak neon light tube several feet on either side of the target. This momentary ionization to the air might even produce a very mild zap sound, and over all a very interesting picture of night combat.

Table II

Material	Energy required to melt in Joules per cubic centimeter	Energy required to Vaporize or Decompose in Joules per cubic centimeter
Wood	----	1,800
Acrylic plastic	----	2,200
Aluminum	2,610	35,060
Iron	8,040	62,030

Along with a laser rifle each infantrymen may also carry two or three warhead packs on his belt. He would mechanically and electrically attach a warhead pack underneath the barrel of the laser rifle. After setting his rifle for warhead and approximate range to the armored target, the soldier would take aim and fire. From the warhead pack would burst a pencil thin, hypersonic, heat seeking missle with a 4 grain fusion warhead. As the missle reached the half way point, the laser rifle would fire a pulse beam which would penetrate well into the armored target. The missle would seek out the hot vaporizing metal of the laser beam hole, and drive deep into it before exploding with the force of 28 tons of TNT.

For close in engagement of hard or multiple targets a very compact pistol, perhaps comparable to our present day 45 cal. automatic with silencer, would be used. The soldier would carry a selection of four different projectals. A conventional slug, a 0.008 grain fusion warhead slug equivalent to one hundred pounds of TNT, a half grain fusion warhead slug with a three second delay fuse equivalent to three and a half tons of TNT, and a two grain fusion warhead slug with a three second delay fuse equivalent to 14 tons of TNT. The two delay fuse warhead slugs are designed to give the firing trooper time to duck for cover before the warhead goes off, and with the 14 ton equivalent the cover had better be a boulder or preferably the bottom of a covered fox hole as one hundred yards or less would be the normal range in thick foliage terrain. (Warning: Excessive ussage of delay fuse fusion warhead slugs in rocky terrain may be hazardous to your health; due to irratic trajectory of ricochets.)

The vacuum of deep space is the ideal operating media for the laser. With the proper optics and no atmosphere a laser will produce a beam that will not significantly diverge, scatter or weaken over distances of light seconds or even light minutes. Since the beam in this environment is no more powerful at close range than at long range, combat space vessels will try to find a range at which they may be able to get more hits than their adversary due to better targeting computers etc. Unless future space vessels are capable of exceedingly rapid course changes, the speed of the laser beam (186,000 miles/sec.) will move effective combat range out to about 300,000 miles. For these great ranges low power lasers will assist or replace radar for the purposes of target locating and tracking. Note that according to recent news reports lasers are being used to determine the exact distance between the earthand moon at a given point in the moon's orbit with an error of less than 5 centimeters.

At these great ranges no weapons other than pure energy weapons like lasers will have much value. Any missile, etc, except for time warp drive or the like, would take hours to cover the distance.

Space vessels of the future may carry any type of laser from solid state to gas-dynamic thermally pumped by waste heat from the vessel's propulsion system. One system which might prove of great value would be the laser torpedo. These torpedoes could be carried internally and launched through tubes or carried on brackets outside the ship. The front two-thirds of the torpedo's length would be a gas filled laser tube. The rest of the length would be guidance, propulsion, and three miniature fusion warhead rockets. The torpedo's propulsion would take it far ahead of the launching ship in seconds. The guidance would track the target, aim the torpedo, and then fire the three fusion warhead hypersonic rockets at 120° angles from each other and in a plane perpendicular to the torpedo. At the appropriate distance out the miniature fusion warhead rockets would detonate and the flash would optically pump and fire the laser. If extra gas was carried in pressure spheres at the rear of the torpedo along with extra fusion warhead rockets, it is possible that the hot gases in the laser tube could be emptied into space and the tube recharged for one or even two more firings. The torpedoes could if necessary be as large as the space craft that launched it; much like the mini-submarines built by Germany and Japan during WWII.

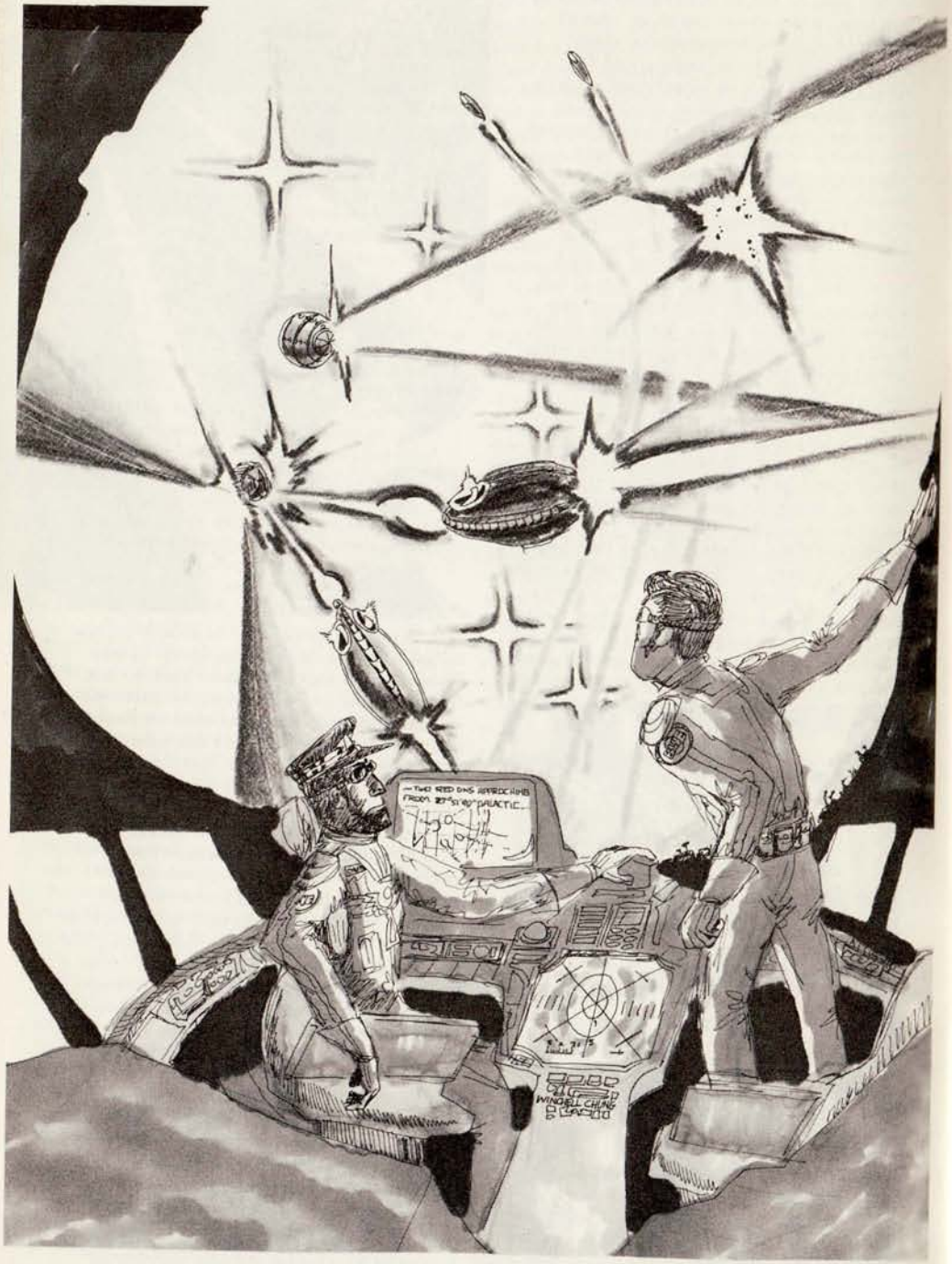
A pure energy force field shield would require tremendous power to deflect or stop a laser beam; probably hundreds or thousands of times the energy required to produce the beam. A more efficient means would be two narrow spaced force fields with the space between filled with a dense gas, which is stored within the ship under normal non-combat situations. By electrically varying the force field in strength and shape the cloud of gas could be moved to the side of the ship most threatened, windows in the cloud could be opened and closed in milliseconds to allow sensors to check the enemy and the ship's own lasers to effectively engage the target, and the cloud itself could be pushed out hundreds of yards toward the enemy vessel in order to more effectively bend and scatter the enemy beam. A laser beam striking such a cloud would undergo significant absorption, scattering, and bending. The force field could be designed so that, as a laser beam strikes the thin cloud, a plasma jet would blow out from the force field cloud in the direction of the laser beam source effectively doubling or tripling the cloud in thickness at the point of contact.

The gas used in the gas laser will readily absorb the same wavelength of radiation that it emits. Therefore, if all combatants are using lasers that emit at about the same wavelength, one gas can be used in the laser tube and in the force field shield. Using this hypothesis, a very exotic war vessel becomes possible. When combat is imminent a force field is formed a very short distance from the outer surface of the ship in the shape of the ship. A second force field is formed further out, in the shape

of a large cylinder and the area between filled with gas to form an inner shield. Force fields three and four further out form a second gas filled cylindrical tube which from the end looks like a donut with the space vessel and the inner shield filling up the donut hole. Special force fields five and six at one end of the outer shield and seven and eight at the other end of the outer cylindridal shield will hold thin layer liquid or vapor metal to form the mirrored ends of the outer shield. The individual crew combat stations within the ship will be specially shielded for nuclear type radiation. The outer cylindrical shield will help break up, and scatter incoming laser beams and function as a laser weapon when optically pumped by fusion warheads shot out beyond the shields. While the outer shield is being used as a pulse laser, the gas would be continuously transferred from the outer shield to the ship, to the inner shield, and back out to the outer shield in an attempt to distribute and remove the heat from the laser.

Current laser development projects provide the S-F writer with a springboard to an almost infinite number of futuristic weapons.

Charles R. Bowles
Colorado Springs



SHIP EFFECTIVENESS IN STELLAR CONQUEST

Edward Cooper's article on the Escort Illusion in TSG #3 made some good points. ESCs are good for scouting, raiding, and convoy duty. They are also cheap. But, the probality of 3 ESCs hitting at ATK was not figured properly. To begin with, just because you roll a 6 on the first roll doene't mean you won't roll it again. So your chance of getting a 10 on the second roll doesn't increase. (When you flip a coin, there is a 50% chance that it will come up heads. Even if it came up tails ten times in a row, there is still only a 50% chance of getting heads the eleventh time.) Therefore, each individual ESC has an 8.334% chance of hitting the ATK. So now you have 3 ESCs, each with a 1/12 chance of destroying an ATK, but you do not add them up (3/12 or 25%) to get the 3 ESCs total chance of hitting the ATK. That will give too high a percentage. The simplest way to figure the right percentage is to find the chance that all three Escorts will miss, and then subtract that from one;

$$1 - (.9167)^3 = .2297, \text{ or } 22.97\%$$

Notice that the answer, 22.97%, is lower than Cooper's figure of 29.504%.

3 ESCs have a 22.97% chance of hitting one ATK, but they might be able to destroy two or even three ATKs in one turn. To destroy 3 ATKs, each Escort would have to score a hit. The chance of that is p^3; or the chance of one ESC getting a bit, cubed - $(.0833)^3 = .0006$ or .06%. Figuring their chance of hitting two ATKs is a little more complicated. The mathematical formula is:

$$_nC_r\, p^r q^{n-r}$$

p is the probability of a single event occuring, q is the probability of it failing to occur, and r is the number of times you want the event to occur in n trials. $_nC_r$ is the number of ways the event can occur r out of n times. Here are the possibilities:

	1st ESC	2nd ESC	3rd ESC
1st -	hit	hit	miss
2nd -	miss	hit	bit
3rd -	hit	miss	bit

So there are three ways for three ESCs to hit two ATKs. Substituting, the equation becomes:

$$3(.0833)^2(.9167)^1 = .0191 \text{ or } 1.91\%$$

Note that this is the probability of 3 ESCs hitting <u>exactly</u> 2 ATKs. The formula for getting their chance of hitting <u>at least</u> 2 ATKs is:

$$p^n + {}_nC_{n-1}p^{n-1}q + {}_nC_{n-2}p^{n-2} + \ldots + {}_nC_r p^r q^{n-r}$$

The variables stand for the same things as before, but r stands for the least number of times you want the event to occur. Note that this equation is simply the sum of several terms in the form of the other formula. Anyway, the chance of 3 ESCs hitting at least 2 ATKs is:

$(.0833)^3 + 3(.0833)^{3-1}(.9167) = .0197$ or 1.97%

Probabilities for other ship-ship situations would be calculated in the same way. The results are tabulated in the chart titled Probability for Hits in Ship-Ship Combat. These figures give the chance of getting <u>at least</u> a certain number of hits. For example, 5 ESCs have a 35.27% chance of hitting at least one ATK. Their chance of getting exactly one hit is .3527 - .0585 which is .2942, or 29.42%.

The chart titled Effect of ISW on Ship Firing gives the chances of a ship getting hits if it has Improved Ship Weapons. The figures are higher, of course, but notice that they are <u>not</u> doubled. However, ships with a smaller chance originally (such as ESC vs. ATK) benefit the most. Their chances increase by a larger factor than a ship or group of ships that had a better chance in the first place.

It is fairly easy to judge strength when both players have the same kind of ships, but what about situations like ESC vs. ATK and ATK vs. DN? You can buy 2 ATKs for the same IU price of a DN (not counting the research costs), but which force is stronger in battle? To begin with, let's assume that both players are at a major colony, and they both decide to fight it out to the bitter end. There will be some fire turns in which neither player gets a hit, but those turns have no effect on the outcome of the battle, so they can be ignored.

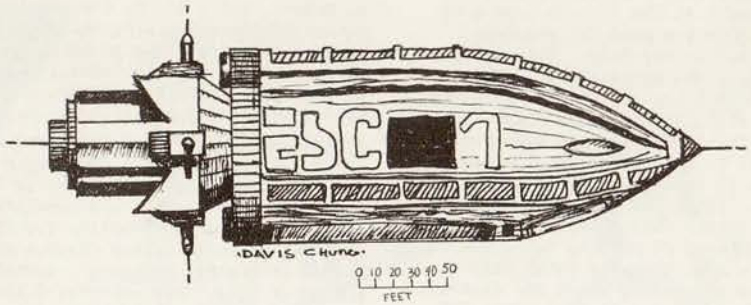
From the initial situation of 1 DN vs. 2 ATKs, there can be three results: 0 DN vs. 2 ATK, 0 DN vs. 1 ATK (both victories for the ATK force), or 1 DN vs. 1 ATK, which is a new situation.

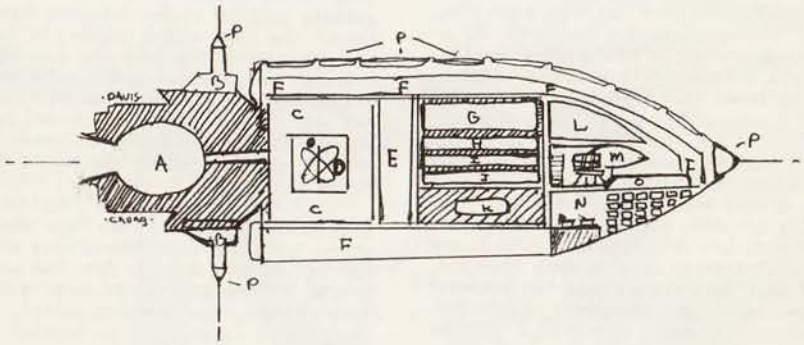
From this new situation the possible outcomes are: 1 DN vs. 0 ATK, 0 DN vs. 1 ATK, or 0 DN vs. 0 ATK. The percentages for these outcomes are:

from 1 DN vs. 2 ATK
- 0 DN vs. 2 ATK - 13.78%
- 0 DN vs. 1 ATK - 13.78%
- 1 DN vs. 1 ATK - 72.45%

from 1 DN vs. 1 ATK
- 1 DN vs. 0 ATK - 84.61%
- 0 DN vs. 1 ATK - 7.70%
- 0 DN vs. 0 ATK - 7.70%

The probabilities for final victory are:





ESCORT FROM STELLAR CONQUEST

A. Torch Drive Unit
B. Rear Beam Generators/Sensors
C. Fuel Storage Compartment
D. Gyro Stabelizers
E. Main Computer Complex
F. Radiation Shield, Dry Bulk
G. Crew Quarters/Cryonic units
H. Life Support Engineering
I. Storage/Back-up units
J. Battle Computer/ Communications
K. Internal Systems Reactor
L. Main Beam Generators
M. Torpedo Launch/Control
N. Planetary Shuttle Deck/
Planetary Nukes
O. Planetary Attack/Sensor Control
P. Beam Plates & Projector Systems

Davis Chung

DN, .7245 x .8461, or 61.30%
ATK, .1378 + .1378 + .7245 (.0770), or 33.14%
Exact tie, .7245 x .0770, or 5.88%

The DN has a much larger chance of winning than the 2 ATK, which isn't surprising. Since ISW benefits a weak ship more than a strong one, you might expect that the ATK force would have an improved chance if it had ISW, even if the DN also had ISW. This turns out to be exactly the case:

ohance of victory for,	DN has ISW	ATK has ISW	both have ISW
the DN	71.16%	39.55%	51.31%
the two ATKs	22.37%	52.96%	38.94%
exact tie	6.47%	7.52%	9.76%

Now what about a force of Escorts fighting a force of Attacks? You can buy 2.5 ESCs for the price of a single ATK. Cooper rounded that up to three, but if you try that during an actual game you'd better meke sure the other players don't find out about it. The simplest situation that is also equal in IU cost is 2 ATK vs. 5 ESC. The probabilities are 65.86% that the ESCs will win, 32.77% that the ATKs will win, and 1.38% that both forces will be destroyed at the same time. Obviously, the ESC force is much more powerful than the ATK force of equal IU cost.
The figures for other situations, taking ISW into account, are at page bottom.
Three Escorts are overwhelmingly superior to one Attack. Even two Escorts are nearly as good as one ATK, and better if they have ISW regardless of whether or not the ATK has it. Thus, on an IU cost basis, Escorts have more combat power than Attacks. However, DNs are still more powerful than Attacks, even on an IU cost comparison. This is because Attacks cost half as much as Dreadnoughts, while Escorts cost only two-fifths as much as Attacks. Also, a Dreadnought needs a one, two, or three on the die to hit an Attack, but an Attack needs a one or two to hit an Escort.

Escorts are more economical than Attacks. And five ships can do more jobs than two. But should Escorts be more powerful in ship-ship combat? I don't think so. One solution might be to have the Escorts get an eleven instead of a ten, or to have Attacks get a one, two or three. That would redress the power balance and still leave the Escort with the advantage of economy. Another factor that constrains a player from building too many ESCs is research. His swarm of Escorts may be able to defeat the enemy Attacks, but they can't touch a Dreadnaught.

Someone could come up with a tactical space combat system, too. This would add to length of the game, but, it would eliminate some to the luck involved, and Stellar Conquest is a long game anyway. For example, The Ythri's space battle portion might work. ESCs would be equivalent to Planet Class ships, ATKs would be Supernovas, and DNs would be mobile Guardian Satellites with an MA of 3. The opposing fleets would fight it out on the Space map with grounded PCs and/or SNs taking part as Missles Bases or Advanced Missle Bases. You could even devise a more detailed space battle sequence, but, that would result in an extremely long game. However, there should at least be some kind of system that allows some tactical manuevering.

Tom McDermott
Florisant, Missouri

1 ATK vs. 3 ESC (a more expensive ESC force)

	Regular	ATKs have ISW	ESCs have ISW	both have ISW
ATK victory	26.41%	41.67%	9.26%	19.07%
ESC victory	71.18%	54.54%	88.97%	77.31%
Exact Tie	2.40%	3.79%	1.76%	3.62%

1 ATK vs. 2 ESC (ESC force cheaper than ATK force)

	Regular	ATKs have ISW	ESCs have ISW	both have ISW
ATK victory	50.05%	64.03%	28.32%	42.59%
ESC victory	45.41%	30.15%	66.30%	49.32%
Exact Tie	4.55%	5.82%	5.38%	8.09%

PROBABILITY FOR UNITS IN SHIP-SHIP COMBAT
Number of Firing Ships

		ESC/MB 1	2	3	4	5	ATK/AMB 1	2	3	4	5	DN 1	2	3	4	5
SCT CT	1	66.67	88.89	96.30	98.77	99.59	83.33	97.22	99.54	99.92	99.99	100	100	100	100	100
	2	0	44.45	74.08	88.90	95.47	0	69.44	92.59	98.38	99.67	0	100	100	100	100
	3	0	0	29.63	59.27	79.02	0	0	57.86	86.80	96.45	0	0	100	100	100
	4	0	0	0	19.76	46.10	0	0	0	48.22	80.37	0	0	0	100	100
	5	0	0	0	0	13.17	0	0	0	0	40.18	0	0	0	0	100
ESC MB	1	16.67	30.56	42.14	51.78	59.82	33.33	55.55	70.37	80.24	86.83	66.67	88.89	96.30	98.77	99.59
	2	0	2.78	7.41	15.20	19.63	0	11.11	25.92	40.74	55.90	0	44.45	74.08	88.90	95.47
	3	0	0	.46	1.62	3.55	0	0	3.70	11.11	20.98	0	0	29.63	59.27	79.02
	4	0	0	0	.08	.33	0	0	0	1.23	4.53	0	0	0	19.76	46.10
	5	0	0	0	0	.01	0	0	0	0	.41	0	0	0	0	13.17
ATK AMB	1	8.33	15.97	22.97	29.38	35.27	16.67	30.56	42.14	51.78	59.82	50.00	75.00	87.50	93.75	96.88
	2	0	.69	1.97	3.72	5.85	0	2.78	7.41	15.20	19.63	0	25.00	50.00	68.75	81.25
	3	0	0	.06	.22	.51	0	0	.46	1.62	3.55	0	0	12.50	31.25	50.00
	4	0	0	0	0	.02	0	0	0	.08	.33	0	0	0	6.25	18.75
	5	0	0	0	0	0	0	0	0	0	.01	0	0	0	0	3.13
DN	1	0	0	0	0	0	8.33	15.97	22.97	29.38	35.27	33.33	55.55	70.37	80.24	86.83
	2	0	0	0	0	0	0	.69	1.97	3.72	5.85	0	11.11	25.92	40.74	53.90
	3	0	0	0	0	0	0	0	.06	.22	.51	0	0	3.70	11.11	20.98
	4	0	0	0	0	0	0	0	0	0	.02	0	0	0	1.23	4.53
	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.41

Percentage Chance of Hitting at Least:

EFFECT OF ISW ON SHIP FIRING PROBABILITY
Number of Firing Ships

		ESC/MB 1	2	3	4	5	ATK/AMB 1	2	3	4	5	DN 1	2	3	4	5
SCT CT	1	88.89	98.77	99.86	99.98	100	97.22	99.92	100	100	100	100	100	100	100	100
	2	0	79.01	96.57	99.50	99.93	0	94.52	99.77	99.99	100	0	100	100	100	100
	3	0	0	70.24	93.65	98.83	0	0	91.89	99.55	99.98	0	0	100	100	100
	4	0	0	0	62.43	90.18	0	0	0	89.34	99.27	0	0	0	100	100
	5	0	0	0	0	55.50	0	0	0	0	86.85	0	0	0	0	100
ESC MB	1	30.56	51.78	66.52	76.75	83.85	55.55	80.24	91.22	96.10	98.26	88.89	98.77	99.86	99.98	100
	2	0	9.34	22.31	35.82	48.33	0	30.86	58.29	76.58	87.42	0	79.01	96.57	99.50	99.93
	3	0	0	2.85	8.80	17.06	0	0	17.14	40.00	60.32	0	0	70.24	93.65	98.85
	4	0	0	0	.87	3.29	0	0	0	9.52	26.45	0	0	0	62.43	90.18
	5	0	0	0	0	.27	0	0	0	0	5.29	0	0	0	0	55.50
ATK AMB	1	15.97	29.39	40.67	50.14	58.10	30.56	51.78	66.52	76.75	83.85	75.00	93.75	98.44	99.61	99.90
	2	0	2.55	6.84	12.24	18.29	0	9.34	22.31	35.82	48.33	0	56.25	84.38	94.92	98.44
	3	0	0	.41	1.43	3.16	0	0	2.85	8.80	17.06	0	0	42.19	73.83	89.65
	4	0	0	0	.07	.28	0	0	0	.87	3.29	0	0	0	31.64	63.28
	5	0	0	0	0	.01	0	0	0	0	.27	0	0	0	0	23.73
DN	1	0	0	0	0	0	15.97	29.39	40.67	50.14	58.10	55.55	80.24	91.22	96.10	98.26
	2	0	0	0	0	0	0	2.55	6.84	12.24	18.29	0	30.86	58.29	76.58	87.42
	3	0	0	0	0	0	0	0	.41	1.43	3.16	0	0	17.14	40.00	60.32
	4	0	0	0	0	0	0	0	0	.07	.28	0	0	0	9.52	26.45
	5	0	0	0	0	0	0	0	0	0	.01	0	0	0	0	5.29

Percentage Chance of Hitting at Least:

ALLOCATION OF BONUS INDUSTRIAL OUTPUT UNITS: WHICH WAY IS BEST???

Beginning players are often confused as to what can be "bought" most economically with the 25 Bonus Industrial Units each player receives upon starting the game of SC. Experienced gamers may also have this problem upon occasion. Both "bumm" and "hump", trying desparately to decide if IIT is less expensive per performance ratio than 3MA or if extra ship building can be done at a nominal cost less than either. Presently, they almost succeed in throwing the rules in the nearest trash bin out of shear frusration. Which way is best?

The question is not an original one, I'm sure many gamers have asked it over and over since Stellar Conquest came into being. The reason they have been unable to come up with a justifiable answer, however, is the result of seeking it in the wrong direction.

Look at the three developments in question for a minute. We can eliminate the need to discuss extra ship building as everyone can see the plus and minus points in this area. 3MA - When a ship movement allowance has been achieved, it immediately affects all of a player's ships of all types. IIT - When this development is achieved, it increases the attainable population to industry ratio to 2 IU's per million population. A player may now build additional Industrial Units at a cost of 4IU per new IU. Obviously, one can't compare the two in terms of getting more for your money. In one instance, added mobility is given to your fleet, a vital requirement since destinations must be decided on and not altered because of the limits of communications. IIT gives the player the chance to increase his industrial output to twice what is was. How can you compare the two?

Do you suddenly glimpse the truth? Sure enough, experience will confirm the mistake was the absence of a strict (emphasize) detailed plan of action. The fact is, economics and thriftiness never enter into the decision. No one technological achievement is cheaper or more efficient per IU than another, just as no one development is better than another alone. How can they be? Each was designed to fulfill specific game functions in conjunction with one another. Only with the interaction of technological capabilities is a society's science level raised. Remember, Stellar Conquest is a society level game. There is a difference, maybe more than most of you realize. For example, a definition of society: "The system of community life in which individuals form a continuous and regulatory association for their mutual benefit and protection as a collective whole." Not separately, individually, or apart, collectively - by an interaction of events in every regards, technology included.

THE MOST IMPORTANT CONSIDERATION TO TAKE INTO ACCOUNT WHEN SPENDING YOUR BONUS IU'S IS THE TYPE OF GAME STRATEGY YOU AS A PLAYER ARE GOING TO PURSUE. In this way only, is a player able to use to optimum advantage the expended IU's. As many of you have found, or will find, changing your basic game scheme can be fatal unless you have the resources to do so. In most cases the latter is not possible. Changing game method involves a reassessing of your particular society's goals. In other words, IU's spent in the past in a certain production sequence for a specific purpose must now be regenerated into alignment as the importance of that purpose shifts. To do this safely, you must have at least 25% more IU output than the other players, and you don't know exactly how many IU's output they have! If you have colonized a habitable NM planet or captured a colony you will be all right. "Shifting" takes not only IU's, but time as well. Time in which you leave yourself open to attack should an attack come. (This is if you do not have the above) A shift in strategy usually occurs in the middle of a game, after the player sees developments. Yet, this is just when was is most likely. You can see why extensive pre-planning is necessary if you wish to be a good player. You must decide. It's often a good idea for a player to sit down about 30 minutes before SC is about to start and ask himself what goals he is going to try and achieve - immediately, and later overall. It's a necessity to organize your thoughts.

Interestingly enough, failure to do so results in a certain problem common to our society of today, showing you the ill planning that has gone into this one. First, changing game strategy means changing the type of IU output your colony has produced in the past. Isn't it true that as the emphasis on industrial technology changes, society changes because of it since both are directly tied together? Social change occurs. Sociologists refer to the basic forces causing social change as 1) industrial changes and inventions, 2) the spread of culture, 3) culture conflicts, and, 4) war and revolution. Isn't it obvious? Stellar Conquest deals directly with a spread of culture over an area and the conflicts that arise. This unstabilizes your society as it is. The only reason the social system doesn't errupt in chaos is because your society is on a common directed path. A complete shift in industrial thought would surely throw them off this common path and affect their ability to produce, to stabilize themselves. An anachorism called Cultural Lag then occurs.

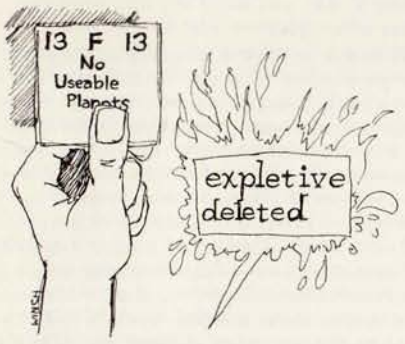
Gultural Lag is a theory that describes how and why culture changes. According to the theory, social change starts with the invention or change of new technology, but the ideas of people tend interfere with it's most efficient application. For example, the invention of the first automobile created antagonism on the part of people who could understand horses but could not conceive of this mechanical device. The same way with the invention of the airplane. People's ideas lagged behind the change. Society is thrown into a mild rebellion against change and thus production will lag also. The consequences are evident.

SC, unlike most "bard" sf games where the accent is placed on tactical turn to turn situations, deals with strategic concepts expanded over a period of years, and players should learn to plan their game on this level. Here is every, well most, sf gamers' weakness in SC at the current time. Most sf games in the past have been of a tactical nature. Players have gradually begun to think instinctively along the same lines. They seek the immediate returns instead of having the patience to let a strategy develop over a longer period. You can see why this would tent to impede their playing efficiency. Players having to make the "jump" to SC not only have to learn a new set of rules, but a new way of thinking as well.

To pick a game plan and pick a good one can overwhelm you. You are asking yourself to look into the future and debate the different play possibilities, an almost impossible task, yet one you have no choice but to attempt. Not only must you decide what you are going to do, you must try and predict what other players will do and how they will react to moves you make. As mentioned earlier, it's best to ask yourself what goals you wish to achieve and when. This will give you a working knowledge of what developments or ship material you are going to need and at what time you will need them. A pre-planned industrial schedule is excellent for this purpose. Don't fool yourself either. Geographical considerations can and must be taken into view. A good quadrant may mean a brief spurt of expansion to the boarders of your own space territory with stress placed on building up a concentrated defensive posture to protect the many PLANET POINTS you have acquired. A relatively sparse quadrant may mean immediate mobilization to have the capability to explore, defend, and seize large areas of space in order for your society to survive.

Another advantageous method to employ in choosing your initial expenditures is to ask yourself what 'type' of player you are. Your play type will definitely influence the game. If you are an agressive player, you may lose ships in quest of things another player would back down from. You may also gain more too. If you play conservative, a gradual but steady buildup may be best for you, leaving you free to place initial expenditures into technology rather than war materials.

As the game progresses, it will become increasingly evident you are not able to produce all your race needs for total security. In SC you must learn to predict another player's moves accurately enough to be in the right place at the right time. Therefore, you have to make the decision to sacrifice some aspects while retaining others in the Technological Development Sequences. Too often a player does try to spend, spend, spend in every catagory. This would be fine except now instead of being strong in one particular field, thus holding attack and counterattack ability, you are weak in three areas holding no such option. Of course, if you are fortunate enough to discover a NM planet or conquer someone, most likely because of a similar mistake on his part, you can then begin to expand your research into other areas. Up until that



time, be stubborn enough to stick with your original game plan, even if at times it seems less than adaquate. Trust your intuitive judgement. Trying to change right in the middle of things will only cause you more problems than you have now. Capability is the big word. At all times must you ask, "Do I have the capability to do this safely?" If there is but the slightest hesitation on your part the answer is no. Gamble only when you are sure your gamble stands a chance. This is an art in itself. Being consistant in purpose and expenditures could just well make the difference bet ween winning, or coming in second. The way to a good end starts with a good beginning.

Edward Cooper
6350 Cinnabar Dr.
Riverside, CA 92509

LETTERS

In TSG #4 Mr. Neil Shapiro gave a rather negative review of the game 4000 A.D. He cites numerous problems with the game from both a realistic and playability points of view. In this short article I will deal with just one of those aspects: the combat resolution system.

I agree with Mr. Sahpiro. In an apparent attempt to create a unique, "spacy" type of combat, the designers have seriously crippled the playability and fun of the game. In the original rules, if a force of ten ships garrisoning a star are attacked by a force of eleven enemy ships, the defender is destroyed entirely with no loss to the attacking ships. A unique system indeed, but one that hampers playability.

I think that an easier and more effective system is as follows: when a force lands at an enemy occupied star, the number of defending ships is subtracted from the number of attacking ships to attain a differential. This amount of ships is immediately subtracted from the defender's force. When this is done, an even exchange of the remaining defender's ships attacker's ships follows.

Example: A force of 12 ships attacks a defending group of 9 ships. The differential is three, the number of defender's ships that are immediately removed, leaving a force of six. The defender then loses all of these while the attacker loses six as well, with an end result of six of the attacking ships in possession of the star.

This new method of computing combat results does not introduce any luck (i.e. chit-pick of die roll) into a system that originally did not have any, and hopefully gives a more equitable result.

Tony Watson
Las Vegas, Nevada

****

I feel your magazine has a strong start, and has the potential of becoming a great SF "zine." .....One more thing: please don't include satire or humor (at least not much) as I feel (and so do others, I hope!) that satire and humor can wreck the content of a SF "zine."

Brian Bloomquist
Minneapolis, Minnesota

****

I just got through reading the letters to the editor in #3 again and I'd like to comment on my own letter.

It appeared to even me that my comments then were attacking Steve Cole personally and I'd like to apologize for it, as I was only trying to point out how figures could be made to show anything a person wants them to. Numbers are irrevelent in wargaming because people don't play the numbers, they play the games. The only numbers that are important are victory points and sales. A game can be designed to last for days but if it's a poor game and no one buys it then what good is it? But if the game is good and has mass public appeal it will sell and make money, and (to the purist) as ugly as that seems, is the necessary quality, the game must make money to survive.

Rick Pavek
Editor Space Section
PURSUE AND DESTROY

****

I recently received a copy of TUNNELS AND TROLLS. It is a nice book for the price but where is the following information that should be in any rule set: 1. a time scale and turn sequence, 2. movement rates, 3. missile weapon ranges. Without these, to the beginner the rules would be a dead loss.

I would suggest the authors put this information on an addenda sheet and make it available quickly, to have any hopes of keeping sales up at all. This information lacking doesn't bother me. I have the whole D and D book line, so I can put together a decent time, distance scale. It is the novice who could be discouraged by this book.

Warren G. Burrus

(Some of the information is available in the T&T supplement #1 from Flying Buffalo. See plug. Ed.)

****

I recently bought STELLAR CONQUEST and THE YTHRI from Dibbles Hobby Shop here in San Antonio. I was quite pleased to find both games realistic and playable, and that's something I'm seldom able to say about any simulation game, let alone one in my favorite area--science fiction/fantasy. I'm afraid I'm what is called a "super-realism freak."

STELLAR CONQUEST is, in my opinion, one of the two best science-fiction games on the market at this time. The other is LENSMAN. Neither game (of course) is perfect; however, both make other SF games (e.g. EMPIRE I, STARLORD, STAR PROBE, etc.) look makeshift. This does not mean that these other SF games do not have any good ideas, they do. EMPIRE I allows its players to design their own ships, although I do not like the way it is do

is done. A method for designing ships could be built into STELLAR CONQUEST's Technological sequences fairly easily and perhaps optionally. STARLORD has different victory conditions for different races, which seems to be desirable since it is hard to believe that all races have the same goals as humans have. STAR PROBE--this almost unplayable game (???) from TSR does attempt something that no other game I know of does; it tries to show contact between life-forms other than other players. It does not do too well for many reasons: the rules are not clear, the whole thing is much more complicated than the designer seems to have thought it was, yet he made it much more complicated than it needed to be in a game of the scope bis is supposed to be. The most upsetting thing about STELLAR CONQUEST is you decision to omit intelligent life from the game. I know that including this would have at least doubled the length of the rules, but.... I also wish that rules were included for using a "battle board" to resolve battles (like LENSMAN). In fact, I use LENSMAN's battle board rules in STELLAR CONQUEST. One last comment, science always advances fastest in time of conflict, therefore, in reality, it would not be too long after the first Planetary Force Screen was encountered until a ship would be developed that could go through one like so much vacuum.

THE YTHRI is an interesting game, but I don't feel able to comment on its reality as I have not read THE PEOPLE OF THE WIND. I will point out that this game is only played on "half" (or less?) of Avalon! For a generalized space/planet system it would be necessary to have another planet map for the other side of the planet. Given this, a rule of rotation (of the planet) would also be needed. What about attacks by space ships on ground units?? Of what use is Morgana? If you are using GEP's it does not do anything!! One should be able to upon its surface. All in all, THE YTHRI may be a good simulation of Poul Anderson's THE PEOPLE OF THE WIND, but as a planetary system addition to larger-scale games it is too limited. Don't misunderstand me, both games are excellent and I am not trying to belittle your design efforts; I'm simply suggesting what I would have done had I been in on the designing of these games.

Randall S. Stukey
San Antonio, Texas

(Randall admits his love of reality which seems to account for what he found short in THE YTHRI. Note related articles this issue. Ed.)

****

Since pocket calculators have become common, we might as well put them into use. The following system of hidden movement in STARFORCE requires a calculator with a constant function.

The location of a starforce is expressed as a seven digit integer, ZZSHHHH, where ZZ is the absolute value of your zulu-coordinate; S is 1 if your zulu-coordinate is positive or zero, 0 if it is negative; HHHH is the number of the hex as printed on the map. As examples of this notation, Sol is located in lite-zulu 0012020; Alpha Centauri is located in 0401821.

Before the formal search, if either player has a force in lite-zulu where he knows his opponent has a star gate, he should announce this. Player A begins the search procedure by entering the location of one of his forces into the calculator. This number should be saved as a constant divisor and then divided by itself, leaving a "1" on the display. He then hands the calculator to Player B, who enters the location of one of his forces and divides it by the constant. If the result is anything but a "1", the two forces are not in the same lite-zulu, and Player B enters the location of his next force, etc. After Player B has entered and divided all of his forces, Player A enters his next force, and Player B searches again.

This method can be used in STARFORCE because two forces must be in the same lite-zulu to sight, and also because players are not likely to have starforces in a great many deep-space lite-zulus at any given time. Naturally, the method is vulnerable to a player searching locations where he has no forces. Player B could also divide and reciprocate to try to discover the constant. So if A and B are likely to suspect each other of fudging, a third player is advisable.

Doug Rappel
Anchorage, Kentucky

****

Re your editorial: I think the one word definition you're hunting for is "escapists." For whatever reasons, our actions seem to show that we feel sufficiently cramped in our present situations that we are willing to invest some effort in imagining ourselves in others. Maybe if we could write--really subcreate (Tolkien's word) our own fantasy worlds--we wouldn't be interested in gaming. As it is we prefer the more active role of gaming to simple passive reeding, at least some of the time. Would "active escapist" do?

Raymond Westerdahl
Denville, New Jersey

In my view the best evaluation of a game is the most informed evaluation, i.e. written up by one who is thoroughly familiar with the game. Such a critic and I dare say only such a critic is competent to judge. The critic whould first of all describe the game in all its facets as accurately as he is able, and then and only then should he "pass judgment" on what he feels to be its strong and weak points, being careful to point out to the reader his reasons for the particular evaluation. For example, a reviewer might find a certain game too long to his taste, simply because he likes a short game which he can finish in an evening and still get up early the next morning and go to work. Other players may be more flexible in their personal schedules and indeed might prefer a longer game. The point is that the length of a game (and certain other game features) are per se neither good nor bad. Two points more: the best critic or reviewer should strive to be constructive: if for example he discerns faults in a game, he should seek to discover ways in which those faults might be remedied. Hence, if he finds the rules poorly written, he should strive to point out specifically what is unclear. If the play of the game is slow and drawn out, often it can be helped by addition of some simple playing aids. Point two: I would encourage you to get away from the quantitative method of evaluating. To the vast majority of readers the numbers mean very little unless one knows precisely the criteria by which the evaluation is made. Everyone I am sure knows the old college story of the prof who gives an A to any student who can muster the energy to show up with reasonable regularity, while his collegue demands enormous productivity of the student and even the brilliant ones are hard pressed to get a B. Now clearly that A and B have no meaningful relation to one another. (likewise my evaluations on your Feedback are not very meaningful to you unless you know by experience what I find or perceive to be, say, 'generally acceptable': my standards undoubtedly will differ from the next reader. All this of course is not to say that such Feedback data is not useful to you, for obviously it gives you some overall impression of whether or not you are pleasing your public, but a responsible game review and a constructive game review ought I believe do more.) In summary of this point, I would only add that if the quantitative method is inadequate unless the criteria for the quantities are thoroughly explained, then why not simply explain and forget the quantities.

William Curphey
Zanesville, Ohio

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WANTADS

Correspondence wanted from players of EMPIRE OF THE PETAL THRONE. Please let me know what you think of the game. Lyle Runnels; 6159 Coldwater Canyon,#6; North Hollywood, CA 91606.

Wanted: PBM multi-player--STARFORCE, SORCEROR, STELLAR CONQUEST. Send SASE for details. W. Clumm; Entwood, RR #1; Amesville, Ohio 45711.

Players wanted for STELLAR CONQUEST in my area. Also interested in EMPIRE OF THE PETAL THRONE. T. Harms; 2335 Balsam Dr.; Boulder, CO 80302.

Have openings in STARFORCE, SORCEROR, KINGMAKER, STARLORD, LENSMAN, TRIPLANETARY, and STELLAR CONQUEST. Send SSAE for details. Member AHIKS, CSS, and IDA. William Clumm; Entwood, RR #1; Amesville, Ohio 45711.

Will umpire STARLORD. 20 turns all postage paid. Entry fee six dollars. Send SASE to R. Pouliot; 7304 Carol Lane; Falls Church, VA 22042.

For Sale: The infamous Star Trek Battle Manual by Lou Zocchi (comparable to ALIEN SPACE) outlawed by Paramount. These are collector's items of which I have a few mint copies available. Will sell to highest bidders. Randy Reller; 246 Iris Avenue #14; Stockton, CA 95207.

Advanced SC methods, advanced ships, weapons, defenses, industrial capacity. SC materials required. FREE. $2.00 for postage and handling. To: LDS; Box 485; Glenview, Illinois 60025.

STELLAR CONQUEST Tournament and Match Game Rating Service. For information, send $1 and SSAE to Layout Design Specialists; P.O. Box 485; Glenview, Illinois 60025.

For subscribers only: ads may be placed in TSG at the rate of 50¢ for 25 words per issue.

((Will the designer of 4,000 AD please contact us again. In our move to new offices we've lost your address and correspondence.))

FEEDBACK/GAME RATINGS

The percentage of subscribers responding to each issue has gradually decreased with each issue. This reflects a normal reaction of newness wearing off and, hopefully, doesn't mean general acceptance is declining. Response to this issues feedback is especially encourage to help kick-off the new game rating system. EVERY feedback form is tabulated so your say always counts. Many palyers rely heavily on the game ratings to help them choose games they'll like, one of our major goals in reader service. Please DON'T send in a rating for a game you don't own or haven't played. It distorts accuracy and only hurts the gamer trying to decide how to spend his meagre funds.

Content ratings for TSG #4 did gain a bit of ground as a whole. Eldon Tannish continued his travail as the best or worst thing in TSG, depending on your view. As we've said before, do send in your negative ratings. You have to let us know when you don't like something even when you know others do like it. It keeps us from complacently thinking we're all things to all people. Gamers who aren't SF fanas wish we'd drop Eldon while some gamers and SF fans like it despite the lack of literary polish. "Game" related fiction will continue because we can't survive without the SF fans (or gamers for that matter).

On a scale of 1=low to 9=high the ratings for articles in TSG #4 are as follows.

RATE	ARTICLE
7.19	Empire of the Petal Throne: Review, Mataka
7.09	ATK vs 3 ESC, Mitchell
7.08	Issue #4 overall
6.97	Issue #4 Art
6.91	Sorcerer: Review, Taylor
6.63	Eldon Tannish #4
6.58	4,000AD: Review, Shapiro
6.34	PFS Ripoff...., Goodman
6.25	What's in a Game, Howe
6.19	Triplanetary: Review, Rusch
6.14	Lensman: Review, Rusch
5.71	Tunnels & Trolls: Review, Pound

Two comments on reviews seem fair based on TSG feedback so far. A negative review seems to draw a bit lower rating than a positive review. A short review seems to get a bit lower rating than a longer review. A longer review that gives good information on game components, play, and design while covering both weak and strong points would seem to be the most valued by readers.

GAME RATINGS

These are the last old style game ratings. They represent a composite of all ratings received so far. Only games

with too few ratings to be statistically significant were rated. Sorcerer and Empire of the Petal Throne just barely missed but will rank very highly when there are sufficient rates.

Keep in mind that these old style ratings were on a zero to ten scale which gives a bit different picture than the S&T one to nine ratings. The new ratings shift to the one to nine scale also so comparisons between S&T and TSG reader ratings can be easily attained. The first column HOURS, represents the average time in hours it takes to play a typical game. The second column, COMPLEXITY, represents the relative complexity of the game's design. The third column, QUALITY, represents the relative quality of the components. The last column, OVERALL, represents the overall rating of how well players liked the game as a whole.

WORST GAME NOMINATIONS

Nominations for the worst SF&F game of 1975 (actually all in print thru 1975) got good response. This issues feedback lists the five games getting the most votes STAR RAIDER, BATTLE OF FIVE ARMIES, 4,000 AD, RIGELLIAN WARS, and WAR OF THE WORLDS II. You are again asked to vote for the single worst game from among these five. The "winner" will get the award. The publisher and designer will be invited to print a rebuttal.

Many other games received a scattering of votes. Those games with wider distribution stood a better chance of getting votes because they have more chances of getting a mad buyer. STARFORCE got a few mentions for that reason, not because it's a bad game in general. Other mentions were MiltonBradley's Star Trek game, THE TWO TOWERS, QUEST OF THE MAGIC RING, STAR PROBE, PRELUDE TO ARMAGEDDON, 4thGALACTIC WAR, 3,000 AD. No doubt there are some real bad ametuer games that just don't have a wide enough distribution to get nominated. It seems fair that those who spent more to sell a bad game widely should have the best chance of getting the "prize".

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Alack and Alas! Again the staff of The Space Gamer is having to report that our game in every issue program is not, repeat NOT, instituted. Red "John Galt" Darnigame has failed us again. As promised, he delivered a "game" for publication. But, will we never learn, it just wasn't suitable for publication.

After the fiasco with Red's HOOKER last issue we were sure that things had gotten cleared up, that there had been a meeting of the minds. More fools we. Red had mumbled something about a person-to-person combat game THUMB over the phone but we nixed that for sure and got him straight for sure, or so we thought.

"Gentlemen, this is going to be the BIGGEST, most FANTASTIC thing ever to happen to gaming," Red started modestly. "GAME MAGNATE will sweep the market. No gamer will be able to do without it." Needless to say he had our attention. This certainly didn't sound like one of his usual hair-brained schemes. Gamers might really go for a business game about running a game company.

As Red flourished on the TSG staff was really beginning to feel good when-- "Gol durn FOOLS!" yelled Harley Stetson, his Tequila Sunrise sailing onto the plush shag. "No bank 'a mines gonna put money inta THAT," he said, nearly falling down over his upset stuffed chair.

"Get me all the way up here to this 'hippie' retreat to show me how to blow your whole operation. This idiot is going to show EVERY GAMER in the country that 97¢ of every dollar in the business is in fool advertising. You want your customers to know it costs more to make the damn BOX than the rest of the game. These stimulation gamers stand in awe of you designers and publishers. They have no idea just anyone can get in the business if he can steal some free xeroxing and has $27 dollars for capital," dumb fools.

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GAME	HOURS	COM-PLEXITY	QUALITY	OVERALL
DUNGEONS & DRAGONS	6.7	7.5	7.3	8.4
STELLAR CONQUEST	6.0	6.9	7.2	8.3
STARFORCE	3.8	6.9	7.8	7.3
TRIPLANETARY	3.7	5.4	7.9	7.2
THE YTHRI	3.1	5.3	6.4	6.9
STAR PROBE	6.1	7.1	5.8	6.7
LENSMAN	8.5	7.4	6.6	6.6
STARLORD	3.6	4.9	6.1	6.5
ALIEN SPACE	2.7	4.1	5.1	6.3
STARSHIP COMBAT	2.5	5.7	6.1	6.1
SIEGE OF MINAS TIRITH	3.6	4.1	6.2	6.0
TUNNELS & TROLLS	5.5	6.7	5.2	5.9
4,000AD	2.2	3.6	7.2	5.3
BATTLE OF FIVE ARMIES	3.0	3.5	4.6	4.8
BATTLE OF HELMS DEEP	2.3	4.0	5.0	4.5

SF&F GAMING NEWS/PLUGS

FANTASIA TODAY

Ronald Lowe of 1376 Northmount Dr., Calgary, Alberta, Canada T2L 0G1 is running a postal game of Dungeons & Dragon and a publication Fantasia Today. You can get information for a SASE.

OVERKILL

Messerschmitt War-Gaming offers an 8 page mimeo zine for $1.65 for six issues, 35¢ per single issue. Tom Philo edits and some play-by-mail science fiction type game are offered. OVERKILL is a typical example of hobbyist efforts. That's NOT a put down. Simply a statement of where they are coming from.

STARFLEET COMMAND

This is a tactical/strategic space gaming rule book in which each player builds ships from a component list. The list of over 100 components is divided into control, support, rays & cannons, warheads, propulsion, specials, and defense. Also included are three campaign scenarios, interplanetary, interstellar, and late interstellar. The rules are 10 pages offset, stapled. Available for $3 from Tim Guay, 6514 Nelson Ave, Burnaby British Columbia, Canada V5H 3S8

THE DRAGON

As of the June 1976 issue TSR Hobbies The Strategic Review will change format into THE DRAGON, billed as the only professional magazine of fantasy, swords & sorcery, and science fiction gaming. A six issue subscription is $9, single issues $1.50. Will feature full color cover and interiors, minimum 32 8½x11 pages, and glossy paper.

TSR is trying to get their publication on a newsstand presentable basis and get the jump on the hobby. Based on past work it will no doubt be well worth it.

Available from TSR Hobbies, POB 756, Lake Geneva, WI 53147.

((Such competitve creativity will no doubt force TSG into some tacky response like going monthly in the near future.))

ADVANCED SC METHODS

This is a 26 page set of advance rules for Stellar Conquest by M. David Johnson. "The purpose of these rules is primarily to expand materially upon the rather rudimentary research capabilities encompassed in the basic game." That promises a lot, and delivers in a well thought out addition to SC for those who really have the bug. The bulk of the rules deal with ship technology but other types of technology are also covered.

After seeing these rules Metagaming Concepts has no hesitancy in recommending them as the authoritative advanced rules for Stellar Conquest. Rats off!

Available from Layout Design Specialists, PO Box 485, Glenview, IL 60025 for $2.

TUNNELS & TROLLS SUPPLEMENT #1

A supplement to T & T is available from The Flying Buffalo, Box 1467, Scottsdale, AZ 85252 for $1. It adds to some elements of the game rules that were not covered in much detail in the original booklet. There may also be a second supplement out now also.

CITADEL

This is a set of rules, 12 8½ x 11 pages, designed by Roy Goodwin. Available from Fantasy Games Unlimited, PO Box 182, Roslyn, NY 11576 for $4.

"The wizard is long since dead but his tower remains well guarded. The survival of the kingdom depends upon the recovery of a powerful talisman from within the Citadel." Also included are inserts for 12 floor plans.

CHANGELING

A science fiction zine from K. Allen Bjorke, 3626 Coolidge St, NE, Minneapolis, MN 55418, 50¢ per copy.

Chengeling concentrates on a different theme each issue. The latest issue is on, what else, science fiction gaming. Your editor even has a contribution. Tell Allen we sent you and give him a suprise.

GLASC

The Greater Los Angles Simulation Convention will be June 4,5, & 6. Starforce and Dungeons & Dragons are listed as tournements. For information write Jim Blancher, 17323 Saticoy St., Northridge, CA 91324.

GENCON IX

The oldest, non-bigger, gaming con on August 20, 21, & 22 in Lake Geneva Wisconsin. There will lots of fantasy with a Fritz Leiber seminar and Prof. Barker, the Empire of the Petal Throne creator.

Information from TSR Hobbies Inc., Box 756, Lake Geneva, WI 53147.

MICHICON V

Held by Metro Detroit Gamers on June 11, 12, and 13. Write Bill Somers, 1654 Chandler, Lincoln Park, MI 48146.

ORIGINS II

The big eastern convention sponsored by Avalon Hill. July 23, 24, and 25 in Baltimore Maryland. Write TARC. 4517 Hartford Rd, Baltimore, MD 21236.

The following publications have given us mention at one time or another and we're returning the favor now.

JAYLAND UNLIMITED

A science fiction zine published three times a year by Craig Hill, 220 Standish #1, Redwood, CA 94063. Single issue 50¢. A 45 page, neat looking zine devoted mostly to sf as literature.

TREPONEMA PALLIDUM

A mimeo sf zine of 16 pages from Rich Bartucci, KCCOM. 2105 Independence Ave, Kansas City, MO 64124. Single issues 25¢. An sf zine with gaming by an sf fan and gamer.

TANDSTIKKERZEITUNG

A chatty sf zine. Available for 50¢ from Don Markstein, PO BOX 53112, New Orleans, LA 70153.

IT COMES IN THE MAIL

Another sf fanzine from Ned Brooks, 713 Paul St, Newport News, VA 23605. No price given but postage and a quarter is always nice for zine editors to get.

THE SHADOW OF THE MONOLITH

35¢ or trades only. Another zine with a solid sf flavor. From Eric Larsen, Box 16369, NCSU, Raleigh, NC 27607

GIGO

SF, games, computers and a lot of other variety in a zine that defies a single classifacation. 50¢ for singles or six for $2.50. Steady improvement. From Greg Costikyan, 1675 York Ave, New York, NY 10028.

CREATIVE COMPUTING

A professional magazine devoted to mostly educational computing which includes games of a simple nature usually. $1.50 for a single issue, 6 issues for $15. From Creative Computing, Box 789 M, Morristown, NJ 07960.

ASHWING

This is a very well thought of and established science fiction zine. Good art, thoughtful pieces, and a genuine, gentle on the mind quality. It is for enjoyment by sf fans with no commercial interest at all. No price given but a contribution is welcomed and you might get a copy for 50¢ or so to cover the postage. From Frank Denton, 14654 8th Ave S.W., Seattle, WA 98166.

Continued from Page 22, col 2.

As he raved on we knew we'd never give every guy in the U.S. a copy of our new, 192 page, slick format weekly. No nation-wide TV campaign that had us in a rustic setting with rumpled clothes saying--"Watch out Parker Brothers". Johnny Carson wouldn't want us to guest. We couldn't trade-in for a bigger yacht. It hurt all the more to know he was right. Cottage industry by modish youngsters was the money in the bank image alright.

"Hey guys," Red yelled as he came back in from the john, "while I was out I just dictated three new game designs into my pocket dictaphone. Just wait til you.." but we weren't going to wait. Crud! It had all been so beautiful for a moment.

THE YTHRI: A REVIEW

This is an interesting Science Fiction simulation that is based on Poul Anderson's Hugo nominated novel "The People of the Wind". The game simulates the invasion and planetary combat that occured when the Terrain Empire invaded Avalon. The Empire Player moves his invasion forces and transports on the Spacemap while the Ythri player moves his forces trying to stop the coming invasion. The offensive side is the Empire and the burden of attack is always on him. Meanwhile, the defensive side is the Ytbri player and it is up to him and the deployment of his troops to stop the enemy before they get started. This makes for some interesting Space and Land combat situations. The empire forces are normally just too numerous to stop. The Ythri's Space forces are meager and they should only try to do as much damage as possible without being eliminated themsleves.

Once the invasion forces begin landing on Avalon it is up to the Ythri Militia, Bounce Troops and Atmospheric units to stop the Empire forces. The main objective of the Empire forces is to capture three of the Avalon/Choth base hexes. The Ythri forces should be deployed so as to defend these objectives at all costs. As you can see, the more Empire forces that are eliminated in Space before they land the less that he has to attack the Ythri player. The Ythri player cannot ignore the value of the Tactical Space combat.

The rules for this game are bound in a booklet form with an impressive front cover illustration. The simulation is played by following a "Sequence of Game Events". These Game Events are "Space Movement, Space Ship Combat, Planetary Debarkment, Planetary Movement Planetary Combat and Status Update". The rules are written in such a way as to follow the Sequence of Events. By doing it in this manner player ends up not only learning the game rules but also the Sequence of Events.

The winner of this game is determined by how long it takes the Empire Player to achieve his objectives. If the Empire Player meets his objective by game turn 12 it is a Decisive Victory for the Empire Player. But it it takes him to game turn 18 to gain his objectives it is a decisive victory for the Ythri player. So, as you can see the game is based on how long the Ythri player can hold off the advancing Empire forces.

In summary, The Ythri is a game simulation I can recommend for any gamer. For the beginner this is a game that is easy to learn. For the Veteran it is a game that can be challenging. The

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SORCERER AND WHITE BEAR AND RED MOON

If we are to believe the sages, the new year 4674 of the ancient Chinese calendar will be a year of harmony and noble deeds: the Year of the Dragon. Perhaps then it is not surprising that those who are addicted to board games and to fantasy will be rewarded by the availability of two superb games which will begin a new era of fantasy gaming that will reach beyond the present infatuation with Dungeons and Dragons. Until now, fantasy games have been either pale reworkings of a battle lifted from a novel, or a system of rules requiring extensive record keeping and an imaginative referee. At least five different boardgames recreate battles or sequences from the War of the Ring triology, or from The Bobbit (Quest of the Magic Ring, Two Towers, the Battle of Helmsdeep, Minias Tirith, and The Battle of the Five Armies). Most of these games are dreary affairs, owing much to the hundreds of historical military simulations from which they are direct descendants. Only War of the Wizards represents a board game with a previously unexplored kingdom, and even here, the game requires extensive recordkeeping and has a cumbersome and unclear combat system reminiscent of Dungeons and Dragons. Sorcerer and White Bear and Red Moon break with these traditions to provide two playable yet different games: the first successful products of a new trend: the "imaginary world" board game.

The designer of Sorcerer is familiar to readers of The Space Gamer, Redmond Simonsen, who designed the impressive science fiction game Starforce. Simonsen developed Starforce by crafting a plausible scenario for an alternate future. In Sorcerer he continues that trend by creating a fantasy scenario which becomes the basis for his new game. Simonsen has created a world where magic is fully operative. It is a world where seven universes converge, creating magical rifts in the human environment and where, for those few who have learned the secrets, creatures and power can be summoned at will. It is a world where magical forces clash in a struggle for political power, while mere humans huddle in the non-magical "gray-lands", fearful to venture forth without the protection of those few men of wisdom and power, the Sorcerers.

The game is a delight visually. The heavy paper map-board has hexagons of six different colors (plus white and gray), as the universes are color coded. On this terrain are mountains, rivers, and fantastic cities. The die-cut pasteboard counters are just as colorful, printed with clever silhouettes of airdragons, demonic infantry, trolls, human infantry, fortresses and sorcerers. Special markers are provided for keeping track of the status of the pieces, the sequence of moves, and the vortices (magical storms of chaos). The game has the high professional quality one has come to expect from a Simulation Publications game and comes with the usual 26 compartment plastic tray-package, so useful for keeping the pieces sorted for easy play. The rules are printed in a 16 page, 8½ x 11 folder with a careful index at the front. The board contains the necessary playing aids including a special color wheel and separage combat table, which cleverly codes the effect or unit color and hex color upon movement, combat, and the waxing and waning of units which occurs as these other-dimensional universes begin to shift in and out of phase.

Sorcerer is a game player's game. Set-up is quick in the scenarios provided, since magical units are not present but must be conjured as the game progresses. None scenarios are provided with the rules which include solitare, two-player and multi-player games. The basic game includes rules for magic bolts, conjuration, teleportation, as well as unique movement and combat rules. The optional rules add new characters (Shir, the Black Sorcerer), cloning, biding and assassination, the "cloak of invisibility" and the magic flux. The optional rules provide a framework for new spells (with several suggestions) and encourage additional scenarios. Unlike Dungeons and Dragons, no referee or map-making is necessary. The game can be played immediately and is excellent for solitare play--even using the multi-player scenarios.

Because the game system of Sorcerer is such a departure from other fantasy or simulation games, it may take several sittings to fully master the intricacies of the rules. Once learned, however, the game moves quickly and the rules are remarkable clean and free of ambiguities. Even then, the best strategy and tactics for a talented sorcerer are not always obvious and must be learned with experience. For players who prefer the rich tapestry of a full fantastic social system, weird and unusual creatures, and rare happenings, Sorcerer may seem shallow. The richness of Sorcerer lies in the intricate and balanced magical combat system, where the risks are real but anticipated. Sorcerer can be ordered from Simulation Publications, Inc., 44 E. 23rd St., New York, N. Y. 10010 for $9.00.

If Sorcerer provides an intricate and playable game without sacrificing the fantastic, White Bear and Red Moon provides an intricate and fantastic

world without sacrificing playability. The game is set in the strategic Dragon Pass, located between the kingdom of Sartar and the Lunar Empire. With the intricacy of a good novel, players are introduced to the struggle, ite history, and the mighty and fantastic characters who people the game. With clarity and great wit, designer Greg Stafford provides a 60-page rule book to accompany the pasteboard pieces and 3-color map. The game is not of the same professional quality as one has come to expect from Simulation Publications, but it is clearly of very high standard for a small, private designer. The rule book is lavishly illuatrated with the finest fantasy art I have seen in any game. The art work, the attention to detail, and the brief errata sheet to catch the few omissions and misspellings, make clear that this game is a mature work, carefully and lovingly produced.

Through the game, Stafford provides a framework for the unfolding of an herioc conflict which will be unique each time the game is played. The characters are there: gods, demi-gods, monsters and humans. Their conflicts and histories are sketched out in the rules. Moreover, their fantastic characteristics are fully represented in the rules of the game and not merely in the accompanying prose. The two armies are composed of infantry and calvary as well as an assortment of heros, superheros, magicians, and creatures with exotic powers. The rules booklet is well organized with an index and cross references, and the pages are color-coded to allow quick reference during the play of the game. The tragic flaw of the superhero, to avend the death of his best friend (should it occur) at whatever coat, is cleverly represented in the game. The magical men and gods, especially the crimson bat, the sylphs, and the storm walker, demonstrate the cost of chaotic power with visionary clarity.

Beyond the characters of Sartar and the Lunar Empire, which would make an outstanding game by themselves, is a cast of personages both wonderful and fantastic. Dragon-newts live in fantastic cities, loyal to their inhuman king, a magicial of great power. Cragspider, the firewitch, whose pillar of fire is awesome, lives with her band of trolls in a castle near the Stinking Forest. Sir Ethisrist with hie army of veterans lives at Muse Roost and owns a demonic hound whose ferocity can change the course of history in Dragon Pass. These neutrals (and other fantastic creatures) can be approached in the game by an emissary whose fate is uncertain. Consequently, the outcome of the game is never sure. The game is an inexhaustible source of fantasy adventure where each player is the chief participant within the extensive framework provided. The game can be enjoyed solitare and is eminently playable.

The game has been crafted with great skill and wit, rare in games today. For example, when the carnage becomes too great (20 human units have been eliminated from the game), giants begin to appear attracted "by the smell of carnage and carrion." These monsters attack and eat any stack of units they confront until they are befriended. Even then, the giant is untrustworthy and may later eat its friends, destroying any stack it is with. While it is unlikely that this game can be fully mastered, great and fantastic adventures are sure to be had.

The rules are in a 8½ x 11 booklet and beautifully illustrated. The heavier stock of the map is clearly illustrated with interesting terrain and landmarks. The playing pieces are well printed and designed, although the too thin card stock for the pieces make them a little difficult to handle in play. This minor inconvenience is little to pay for an expansive board game like White Bear and Red Moon. Unlike the almost legalistic and exhausting clarity of Simulation Publications rules, White Bear and Red Moon provides rules which are good reading--especially fortunate given the length of the rules and the complex characteristics associated with some of the pieces.

White Bear and Red Moon should be available from the Chaosium, P. O. Box 6302, Albany, California 94706 for $8.00. For readers in the D. C. area, copies are available of both games in the Little Soldier.

With the advent of Sorcerer and White Bear and Red Moon, fantasy board games are available to rival any of the previously superioe science fiction games on the market. Rejoice in the Year of the Dragon! The Age of Fantasy is at hand!

Sumner N. Clarren
Washington, D. C.

Continued from Page 24, col 2.

Ythri is quick playing, fun and is a game that you can teach a friend in no time at all.

Rick Mataka
New York

INTERSTELLAR WAR

Since I put my foot in it in issue #3 I felt that I should try to give out some of that admittedly hard-to-get information on Einsteinian STL warfare. I will admit freely that I took much from SF writers, Larry Niven and Poul Anderson in particular. But as there have been no serious books on the matter (and who says "Protector" and "Time Lag" are not serious?) I'll have to do the best I can with them.

First we must deal with the Bussard Ramjet, the standard vehicle of interstellar travel. One problem of interstellar travel is the existence of dust and gas in the spaces between the stars. At high speeds these atoms, striking a ship, will create sizable quantities of radiation which will poison the crew. To deal with this, R. W. Bussard in 1960 suggested that gas (mostly hydrogen) be collected and used for fuel for a fusion-powered ship. Bussard and Carl Sagan went on to postulate a ship with a mass of one thousand tons, an acceleration of one gee (at which it could, in a year, accelerate to near-light speeds while traveling half a light year) and using the proton-proton fusion reaction that would have a scoop 1200 miles across. Such a scoop would be of magnetic force, and would either pull in atoms by having a continuous barrage of lasere ionize them first, or, in a way unknown to us now, use the electrical asymmetries of even the neutral atoms to haul them in towards the ship where the field would pinch them together and thus force their fusion. The power produced would be primarily used for propulsion but would also be used to power starship systems. What comes out would be helium, some leftover hydrogen, and certain high order fusion products (including perhaps even lithium hydride, which is generally an impossible chemical). In an article in the September 1975 Galaxy, Poul Anderson stated: "Because many atoms swept through its force field are bound to give off light," a ramship has the appearance of "a translucent shell of multicolored glow, broad in front, tapering aft to a fiery point where the nuclear reaction is going on....Thence the exhaust streams backward, at first invisible or nearly so, where its particles are closely controlled, but becoming brilliant further off as they begin to collide, until finally a nebula-like chaos fades away into the night."

Ramships are vulnerable to certain things, though. Strong magnetic fields and cordate animals do not mix well. Unless they can be shielded or put into a "bubble" in the field, humans may not be able to travel on ramships. Even if they can, the intersecting ramfield of another ship may kill them. Ramming therefore becomes a possible "close-in" tactic. A sudden increase in the quantity of interstellar hydrogen can cause more fusion than the surprised ship can handle. Even if it doesn't, the "surging" effect this can cause may be too much for the field generators. If they give way at high speeds it's all over. One ramship pursuing another may face a variety of weapons, such as a special field to "churn up" the hydrogen behind the fleeing ship to cause surging in the pursuer, carbon vepor bombs that will also cause surging by changing the fusion cycle to the carbon cycle, and bombs containing fissionable elements that will go critical when forced together for fusion, causing an atomic explosion. Fusion bombs and missiles will also be used, more against the gigantic field than the miniscule ship, as well as giant lasers which, while not too useful against distant ships, can be used for signaling and for firing into the pinch to cause surging.

Now that we have the ships let us deal with the warriors and their society. If we assume one system trying to rule another, we have to have some reason for the society to send its sons across many light years (and more real years) to overcome the people of another. Aliens will have their own, alien reasons for doing this. As for humans, idealism, power-lust, need for resources, flight from disaster, or the desire to keep the status quo may cause interstellar invasions. For instance, the citizens of nearby inhabitable stars hear that the residents of Sol System are going to erect a Dyson Sphere around their system to trap as much energy as possible. This troubles the nearby colonists, who fear that the power produced may go into a blackmailing gamma ray laser which could reach across interstellar distances to nova suns. An armada is gathered...

The inhabitants of these systems would have some trouble manning their fleets, however. For while relativity would keep the voyager younger than his compatriots back home, you're still spending decades away from home. Hopefully there will be enough Idealists, Militarists, Patriots, and Tourists to man the fleet. As for an occupation army, you could manage it as long as it was as much a colonisation effort as an army. The settler/soldiers, in the midst of an unfriendly land, would tend to be more loyal to the homeland than to the conquered system, but matters would not remain so forever. Eventually they'd feel themselves to be members of the conquered system, and their lovalty

would shift to themselves. The situation may be helped by doubling or tripling the human life span, and thus encouraging a slowly-progressing society at home which could be left for thirty years and still be easily acclimatized to on return. Nevertheless, an interstellar empire of any size using these methods will not be large, if only due to time lag. If a successful revolt occurred on a colony planat 10 light years away from the ruling system, it would take the rulers 10 years to hear about it and 10 years to send a punitive expedition. This gives the revolting system 20 years at the least to prepare for the counter attack.

Even if systemic rule is difficult or impossible, it may be that rule by a starship people may not be so difficult. Robert Silverberg and Poul Anderson have both written of a people who live out their lives in their ships, carrying the interstellar trade, and seeing many civilizations rise and fall as relativity slows their aging. Such a people could control interstellar trade and, if they wished, even the immediate space around the system. If they controlled interplanetary space they'd control the planets within it, for shooting up against the pull of gravity is much more difficult than shooting down. Even a planet with no big cities to nuke is vulnerable. All the ship people have to do is turn on their ramfield, and every animal below above a paramecium dies. Using the resources of one system a ship people can build another fleet of their tribe, and send it out to conquer another system. Their deployment in a system would have a starship and several systemic spaceships orbiting every inhabited planet, several military starships and systemic spaceships farther out ae sefeguards in case a revolt should destroy the guerd ships, and, yet further out, the home ships of the tribe with escorts. If a successful revolt should occur, these would head for friendlier territory controlled by relatives or allies. As one successful revolt could spark others, they'd probably send forces. The rule of a star tribe would necessarily be light, as cultural differences and the difficulty of maintaining a garrison on those dirty, disease-ridden, overgravitied planets would work against tight rule. They'd encourage the development of spatial resources and interstellar trade, which they would control the transportation for. Some systems could maintain a precarious independence, but on the whole I see little to stop the star tribes from expanding over the Galaxy. Each ship-family and each little tribe would have a very stable culture (as in Heinlein's "Citizen of the Galaxy") so that a trading voyage by a family will not doom it to the difficulties of culture lag. Eventually all human space (and beyond) would be ruled by many tribes of one people who would certainly have to cooperate with each other against the Flatlanders, the Fraki, the Groundhogs who would certainly attempt in places to overthrow their hold.

As a final note, I should mention that detection of a fleet between the stars is not so easy. Depending on the ability of your telescopes and on your luck, you may be able to spot the ships themselves within a few light years. Furthermore, as ramships leave behind strange chemicals, it should be possible to spot a fleet by looking for those chemicals and, by seeing which way they are shifted (according to the spectrum), tell if they are approaching, passing-by or leaving. But remember time lag- you're seeing his position as it was some time ago, not what is is now.

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ELDON TANNISH: PART V

(Eldon Tennish is a gifted, young gamer competing in NORCON, a sophisticated future computer-moderated game tournament. "The Game" is a complex series of heuristically self-directed computer program systems resident in a technologically exotic future computer. Each game usually consists of six to twelve gamers competing in a diversity of computer generated scenarios holographically displayed. Eldon's last game scenario was a series of pocket universes created by a now degenerated culture. The "pockets" were linked by matter transmitting portals. The scenario bad a decidedly fantasy flavor with forgotten science like magic. Part IV left Eldon's holographic projection trying to escape the besieged city C'heng Dra in the company of some dangerous acquaintances.)

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A cubic kilometer of slagged nickel hurtled toward the collision. There, immense by comparison, rolled its benign target. Komal II, simply Komal to residents, was gloomed in perpetual cloud cover. Eighty million humans, a couple thousand aliens, and a few sentient computers regarded Komal as home, clouds and all. A homa of perpetual murk, a military base, and some fabulous mining geology.

The asteroid's backside presented the pitting of a small nuclear war. The impending collision was deliberate. No random accident aimed this mass at the heart of the major southern continent's settlements. To Komal the asteroid's impact would be less than a gnat's effect on a moving bus. To the relatively thin continental plates, it would be only some minor ripples. To the colonists' habitations, it would be unmitigated, total destruction over thousands of kilometers.

With impact still several hours away, an observer above Komal's clouds could have seen flashes on the speeding rocks foward flank. Those fusion flashes would only cut the rocks velocity by 5%. with a minute change in direction. The small changes would put the asteroid a hundred kilometers behind Komal when its path intersected Komal's orbit. Another Kchul attack had been aborted. Too obvious to be really dangerous, the asteroid was only another probing defense.

The colony's key defense lay in close orbit to Komal's sunward surface. The featureless black void somehow shimmered to near invisibility if viewed too closely by eye. The PATTON had suffered more than minor battle damage, but remained a potent force. The colony's two energy beams were unscathed with 85% missiles unlaunched. Komal's defenses underwent probing in force and one major assault had been repulsed. PATTON's beams had fully brunted the attack of four smaller warcraft, totally destroying one. Komal had since been subject to sporadic missles and debris from all directions. Such probes were easily destroyed at the cost of limited supplies and no rest.

PATTON's surviving scouts were scattered in a screen a million kilometers from Komal toward the outer planets. Scout sensors were the best and detected no Kchul clan raiders within range. PATTON's energy field was off to confuse Kchul sensors and conserve energy. Kcbul clan raiders messed about 40% of PATTON's bulk with et least a 50% greater acceleration capactiy. They possessed energy defensive shields of some unknown type that were nearly as effective as PATTON's at most frequencies. The Kchul raiders had made no attempt to rescue survivors of the destroyed ship in the last attack.

At sensor limits a small metallic object with an enormous velocity was detected. Rapid tracking computations predicted a looping curve to pass some hundred thousand kilometers above Komal's orbit et passage time. What sort of threat could such a small object be? It might be more of a surprise than a physical danger, a surprise more than deadly at a crucial time. A scout moved from station to attempt a brief pass; no more was possible given the object's velocity. Just before the scout reached maximum contact point, the object, surely no more than a few metric tons, disintegrated in an intense explosion. The scout barely avoided contact with a rapidly expanding globe of opaque gases.

"Komal COMP CINC order STOP Scouts Handly Flyby intercept cloud for sensor pass through STOP cloud blocking all remote sensor contact STOP cloud rapid velocity loss projected due solar winds Komal's Van Allen envelope STOP BREAK BREAK STANDBY"

"Komal COMP CINC info STOP Plotting two new UFOs same first STOP No Kchul raider activity yet sensed STOP 63.4% prot rate cloud prime function harassment screening STOP Destruction prior cloud dispersement indicated action STOP BREAK BREAK STANDBY"

"PATTON Battle COMP order STOP Handly Flyby proceed Komal COMP CINC directive STOP Screen's maximum estension STOP Special attention track original projectile STOP Heads up STOP Good luck STOP BREAK BREAK"

"Scout P08 Bucket report STOP Two bogeys max range heading 080 240 601 STOP Estimated mass within 20% prior Kchul raiders STOP Screen's up STOP Launching torp supporting bracket STOP Evasive approach STOP Jammers on STOP Receive only mode STOP BREAK BREAK"

"Sky Spy K348 report STOP Three bogeys 120 thou km vel heading 742 019 401 STOP Back orbit solar north sunward STOP Tracking reports follow STOP BREAK BREAK"

"Sky Spy K047 report STOP Three asteroid masses collision path Komal solar south STOP Standing by for missle tracking grid STOP Tracking reports follow STOP BREAK BREAK"

"Komal COMP CINC order STOP PATTON intercept three Kchul clan raider masses back orbit Komal STOP Komal ground launch passing 89 new missles control PATTON Battle COMP STOP 88.7% prob rate NO transports STOP BREAK BREAK STANDBY"

The second major assault developed rapidly over the next few hours. Kchul gas cloud screens proved annoying, but not decisive. Five Kcbul clan raiders meant reinforcements were available to the attack. Defenders had no hope for aid. For a brief span two Kchul craft directly fire fired on southern continental defense complexes. Damage to vegetation was extensive. However, the powerful ground-based beams damaged both attackers and PATTON later destroyed one cripple. Komal survived with loss of two power plants that the beams. The defense was weaker for the loss and the PATTON suffered new damage. It seemed only a matter of time now.

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Eldon tightened his back muscles to maximum contraction and released to relieve tension. Today's tournament game was not the standard multi-player affair. The current tactical battle was a kind of mandatory exercise played directly against the Games computer, a one-on-one match you couldn't win. As defender of the colony, Eldon knew he'd face increasing pressure resulting in defeat. The Games computer had Eldon's psychological and skills profile and would gear its assault to make him lose heart and give up. The pressure of knowing you'd lose did strange things to some players. The nerve, intelligence and concentration of experienced players often deserted them totally. Scoring went to tenacity and brilliance of defense. Trying to be passive and uninvolved to protect your ego resulted in an uninspired, low score defense. The only way to get the performance peak that pressure generated was to be involved and suffer the loss with a full effort. Knowing you'd always be crushed before the end tested your ability to keep trying to the limit.

Highest ranking survivors of today's test would play in the tournament final. Forty players remained to compete today. After a two day break, twelve survivors would meet for the championship. Knowing your chances were only one in four just raised anxiety that much more.

Yesterday's game had been a break for Eldon. Or, perhaps, luck comes to consistent skill a bit more frequently. He'd placed an incredible fourth! That it was barely enough to survive wasn't diminished by the fact that the next four finishers were within two percent of his score. Sullen Bulmar Denholt had been next in that close group. Also, Bulmar had been eliminated by a hair, an especially pleasing event.

The key to Eldon's luck was a sudden, unplanned impulse to remain in beseiged C'heng-Dra and take his chances. As the holographic projections of Eldon, Su-Tush, and Shalmun departed the tower on Shalmun's winged reptile, Eldon had subvocalized the command to Su-Tush's thalamic implant to cut him loose immedistely. Leaping from the still low mount, Eldon's character had landed in a roof-top pool twenty-five feet below. The action was so intuitively quick that reasons for it were not clear 'til later. Shalmun would have him at an advantage once over open country and Eldon's hunches kept telling him Su-Tush must really be another player's character. Better to be rid of them both and remain in C'heng-Dre where the game's shrouded powers seemed to focus.

The hunch about the trade city C'heng-Dra had been all too right. In the confusion of the barbarian assault on the city, he'd managed to locate another portal linking the pocket universes. It had been located in the then tumultuous temple of a particularly deparaved cult which he had been previously watching. Knowledge and use of that key portal gave him a critical bargaining lever that he'd used mercilessly. Bulmar had been Shalmun; and Su-Tush, Alba, the sub-conscious prickling having been right. All in all, it was a surprise survival in the tournament when by rights his greater chance had been elimination.

Eldon's attention snapped back from yesterday's triumph to today's grueling challenge. Mental escapist lapses must be stifled if the Games computer's grinding attack was to be met. The choice of a single large defensive ship instead of several smaller craft seemed a fortunate one for the moment. The Games computer allowed selection of defenses based on an allocation of initial resources. As this trial was played out, the computer kept knowledge of Eldon's defenses separate from the program that controlled the Kchul attacking effort. Eldon would lose, but not because of an attack based on prior knowledge of Komal's defense.

Eldon returned to his console, throwing his entire being into the battle. In some ways, perhaps, he was less afraid of losing than most. His tournament status was higher than any realistic expectation; and one recent game had thrown him close enough to loss of confidence as to impart a kind of immunity. Eldon expected to be eliminated this game. That impending elimination freed him to enjoy the struggle rather than to depress him. Not many young gamers ever had such a play

challenge and he made the most of it.

As the afternoon progressed, his awareness faded into one of those rare creative highs never experienced by most people. It was an a-normal, hazy mental state indescribable with usual semantic, logical constructs. Saying his hie holistic non-temporal right hemisphere functions somehow assumed dominance over left hemisphere linear logic in service of intuition is merely words. What happened to him wasn't words and he wasn't "thinking" in words for a several hour atretch. Afterward, the strangest part of it to Eldon was his total visual and auditory recall of the game. Making review notes later was difficult since he had to recreate a sequencc in his mind without words then try to verbalize his memory.

The course of the tactical battle was a predictable, though fantaatically varied, aeries of attacks progressively weakening the defense without overwhelming it. Each attack could have swept the day, but Eldon's imaginative, unthinking reactions always seemed to stretch dwindling resources just far enough to stave off disaster. The time bought for the defense allowed a lot of jury-rigged activity. Some planetary craft were converted to gun boats armed with commercial energy beams. Power was diverted to give continued energy to the ground beams. PATTON's solar collectors, normally a slow emergency power source, were modified to take intense power directly from ground energy units, thus maintaining PATTON nearer peak puwer. The Kchul's first landing in the north sea archipelago was obliterated with a elowed, redirected asteroid the Kchul had thrown at Komal. The beach head energy shield was still intact under eighty meters of water, all inside dead from shock waves. Events see-sawed for nine game days before a Kchul suicide team finally destroyed the last operating ground projector, ending all effective resistance.

He left his games cubicle in a fogged state.

"Mr. Tannish, Mr. Tannish?"

His eyes relayed the game monitor's image and that of the hall behind to his brain. Eldon nodded acknowledgement, still more in than out of his game conscious state and not yet capable of speech.

"If you'll follow me, sir, to the Lunar Lounge, the briefing will begin in about thirty minutes. My name is Daniel Smith. I'm assigned to you."

Briefing? His watch showed he'd survived all but the last twenty minutes of the gaming period! A quick glance up and down the hall showed all other gamers out of this area. Wordlessly Eldon followed the monitor. In the public area they had to cross a jostle and

press of gaming fans that seemed to bar the way entirely.

"Mr. Tannish! Mr. Tannish!" Two mikes were in his face, insistent that he somehow respond or comment. With a rush came recognition that the attention was focused directly on HIM!

"Uh, hmm," stumbles Eldon's voice.

"Did you know you're the last player out today by an hour and ten minutes?" This from a young, but familiar reportorial presence.

"I...Uh, well...." Eldon stared around with a growing sense of unreality. An earnest journalistic voice to his side was saying, "....fourth longest survival time in tournament competition on record, besting Lyle Croft's mark thirteen years.!"

The monitor cut in determinedly. "Mr. Tannish is due at the shampionship game briefing. All survivors will be available at a post-briefing press conference. For the remainder of the tournament, the Game Monitor's office has assigned me to act as Mr. Tannish's press secretary and general buffer to the world. Autobiographical material on all finalists will be available in the press room at 9p.m. tonight. Additional material on the unique nature of the final game will also be available at that time. The Undersecretary for Colonial Affairs will also be making a statement from Colorado Springs at 10p.m. Trojan Colonies Ambassador Mikhail Solokov will also make a statement at that time." With that long, totally amazing remark, the monitor cut a path through the crowd with Eldon in tow. Just what wee happening? Ambassador Solokov.... Under....! What?

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(Next issue will conclude the series on Eldon's first tournament of "The Game." Fiction on SF&F games and gaming will be a regular feature of TSG. Most of the game fiction will be stand-alone stories. Eldon will be back, but not necessarily in every issue.)